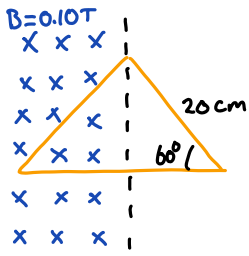
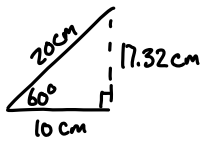
Taylor Larrechea
Dr. Middleton PHYS 132 HW
4-5-17 Ch.33

CQ: 4,5
P: 10,12,80

Problems

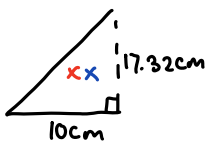
33.P.10





$20\sin 60 = y$

a.) $\Phi = AB\cos\theta$



$B = 0.10T$

$A = \frac{1}{2}bh$

$= \frac{1}{2}(0.1m)(0.1732m)$

$A = 0.00866m^2$

$\Phi = 8.66\times10^{-4}Wb$

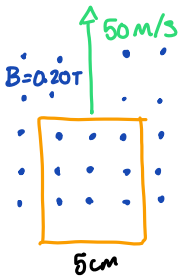
$\Phi = (0.00866m^2)(0.10T)\cos(0)$

$\Phi = 8.66\times10^{-4}Wb$

$\Phi = 8.66\times10^{-4}Wb$
I = must flow ccw

b.) Since the coinciding magnetic field produced by the induced current points into the page, the current must flow counterclockwise according to the right hand rule.

33.P.12



B = 0.20 T
V = 50 m/s
R = 0.10 Ω
l = 0.05 m

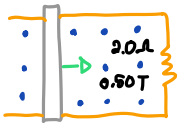
I = 5A

$$I = \frac{Vlb}{R}$$

$$I = \frac{50\,m/s\,(0.05m)(0.20T)}{0.10\Omega}$$

$$I = 5A$$

33. P.50



$l = 0.1\,m$
$V = 0.50\,m/s$
$B = 0.50\,T$
$R = 2\,\Omega$

a.) $F = \frac{vl^2B^2}{R}$

$$F = \frac{(0.50m/s)(0.1m)^2(0.50T)^2}{(2\Omega)} = 6.25\times10^{-4}N \qquad 6.25\times10^{-4}N$$

b.) $P = \frac{v^2l^2B^2}{R}$

$$P = \frac{(0.50m/s)^2(0.1m)^2(0.50T)^2}{2\Omega} = 3.125\times10^{-4}W \qquad 3.125\times10^{-4}W$$

c.) The direction of the induced current is counterclockwise due to the flux decreasing

d.) $P_R = I^2R$, $I = \frac{vlB}{R}$

$$I = \frac{vlB}{R} = \frac{(0.50m/s)(0.1m)(0.50T)}{2\Omega} = 1.25\times10^{-2}A$$

$$P_R = (1.25\times10^{-2}A)^2(2\Omega) = 3.125\times10^{-4}W$$

$F = 6.25\times10^{-4}N$
$P = 3.125\times10^{-4}W$
$I = 1.25\times10^{-2}A$
$P_{2\Omega} = 3.125\times10^{-4}W$

Conceptual

33.CQ.4

a.) Clockwise due to induced $\vec{B}$ field pointing into page

b.) No current

c.) Counterclockwise due to induced $\vec{B}$ field point out of page

33.CQ.5

a.) No Emf, no current

b.) CW current

C.) No current

d.) CCW current